SCREENING SITE INSPECTION REPORT
FOR
WEST 78TH CIRCLE
BLOOMINGTON, MINNESOTA
U.S. EPA ID: MND980995872
SS ID: NONE
TDD: F05-8903-001
PAN: FMN0172SA

MARCH 23, 1990

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International Specialists in the Environment

SIGNATURE PAGE
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1. INTRODUCTION

Ecology and Environment, Inc., Field Investigation Team (FIT) was tasked by the United States Environmental Protection Agency (U.S. EPA) to conduct a screening site inspection (SSI) of the West 78th Circle site under contract number 68-01-7347.

The site was initially discovered on August 15, 1984, when the Minnesota Pollution Control Agency (MPCA) personnel were notified that several 5-gallon metal containers were excavated during backhoe operations at the site. MPCA arrived at the site and collected soil samples from the pile of excavated soil (Cedarleaf 1984a). Analysis of the samples by the Minnesota Department of Health (MDH) on August 21, 1984, revealed the presence of m-xylene, toluene, Aroclor 1254, and 1,1,2-trichloroethylene (MDH 1984).

The site was evaluated in the form of a preliminary assessment (PA) that was submitted to U.S. EPA. The PA was prepared by Elizabeth Gawrys of MPCA and is dated December 13, 1984.

FIT prepared an SSI work plan for the West 78th Circle site under technical directive document (TDD) F05-8706-169, issued on June 5, 1987. The SSI work plan was approved by U.S. EPA on February 2, 1989. The SSI of the West 78th Circle site was conducted on May 16, 1989, under TDD F05-8903-001, issued on March 9, 1989.

The FIT SSI included an interview with site representatives, a reconnaissance inspection of the site, and the collection of five soil samples.

The purposes of an SSI have been stated by U.S. EPA in a directive outlining Pre-Remedial Program strategies. The directive states:

> All sites will receive a screening SI to 1) collect additional data beyond the PA to enable a more refined preliminary HRS [Hazard Ranking System] score, 2) establish priorities among sites most likely to qualify for the NPL [National Priorities List], and 3) identify the most critical data requirements for the listing SI step. A screening SI will not have rigorous data quality objectives (DQOs). Based on the refined preliminary HRS score and other technical judgement factors, the site will then either be designated as NFRAP [no further remedial action planned], or carried forward as an NPL listing candidate. A listing SI will not automatically be done on these sites, however. First, they will go through a management evaluation to determine whether they can be addressed by another authority such as RCRA [Resource Conservation and Recovery Act].... Sites that are designated NFRAP or deferred to other statutes are not candidates for a listing SI.
>
> The listing SI will address all the data requirements of the revised HRS using field screening and NPL level DQOs. It may also provide needed data in a format to support remedial investigation work plan development. Only sites that appear to score high enough for listing and that have not been deferred to another authority will receive a listing SI. (U.S. EPA 1988)

U.S. EPA Region V has also instructed FIT to identify sites during the SSI that may require removal action to remediate an immediate human health or environmental threat.

2. SITE BACKGROUND

2.1 INTRODUCTION

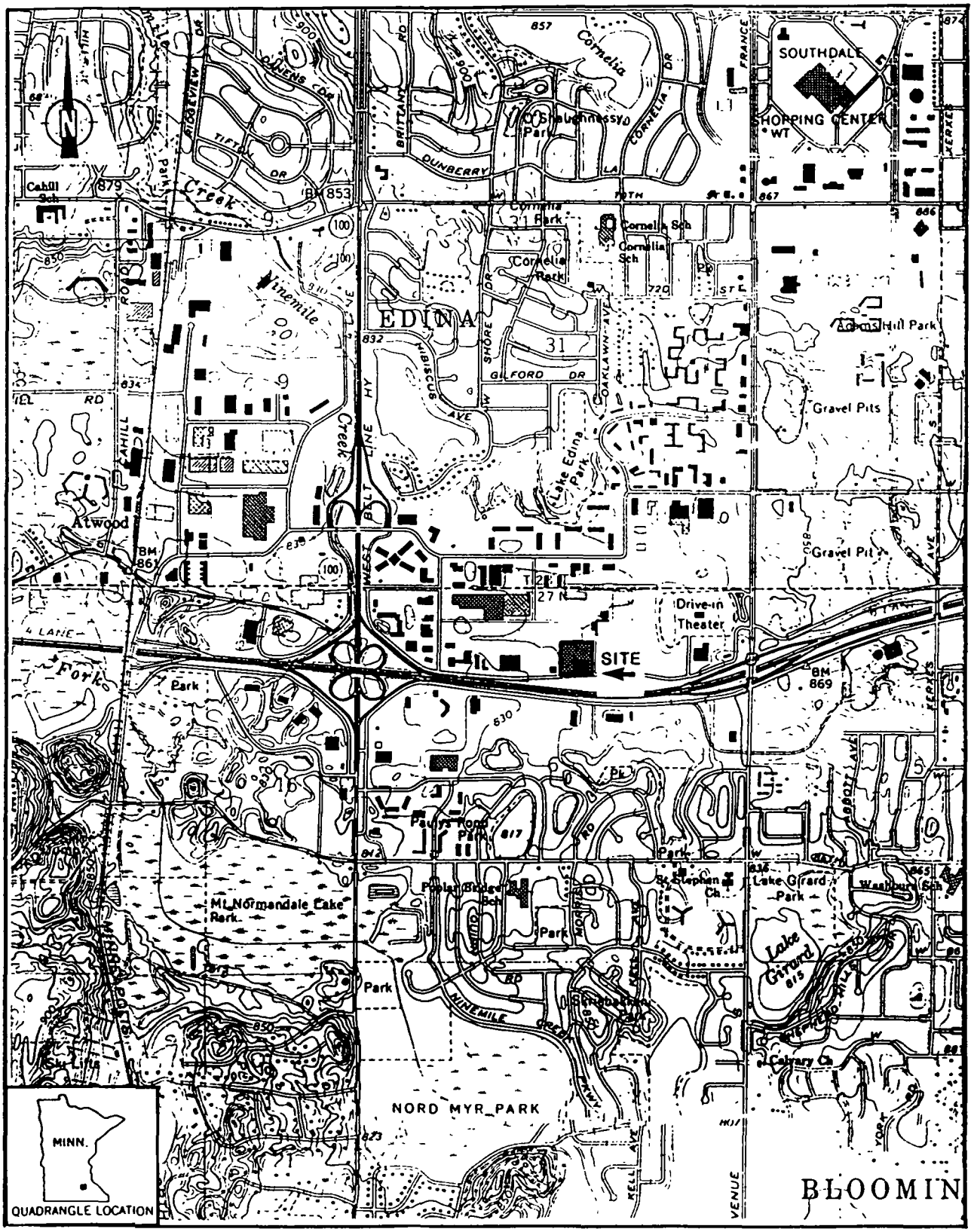
This section includes information obtained from the SSI work plan preparation, the site representative interview, and the reconnaissance inspection.

2.2 SITE DESCRIPTION

The West 78th Circle site consists of an active Stuart Anderson's Cattle Company Restaurants facility (hereafter referred to as "the restaurant") and the surrounding grounds, occupying a 2 1/3-acre parcel of land (Murphy 1989) at 4470 West 78th Circle Drive in the city of Bloomington, Hennepin County, Minnesota (SW1/4NW1/4NE1/4 sec. 6, T.27N., R.24W.) (see Figure 2-1 for site location). A 4-mile radius map of the West 78th Circle site is provided in Appendix A.

2.3 SITE HISTORY

The West 78th Circle site is currently owned by American Restaurant Group (ARG) Enterprises of Newport Beach, California (Murphy 1989). ARG Enterprises purchased the property at West 78th Circle Drive in February 1986 from Marriott Corporation of Bethesda, Maryland. Marriott Corporation owned the property from approximately May 1985 until February 1986 (Murphy 1989). Until its acquisition by Marriott Corporation in May 1985 (Murphy 1989), the property was owned by SAGA Corporation (SAGA) of Seattle, Washington (Hunt 1984). SAGA had purchased the property from Northwest Mutual Life Company (NML) of Wisconsin in November 1983 (Hunt 1984). FIT was unable to obtain information concerning the



SOURCE: Ecology and Environment, Inc. 1990; BASE MAPS: USGS, Bloomington, MN Quadrangle, 7.5 Minute Series, 1967, Photorevised 1972 and 1980; Minneapolis South, MN Quadrangle, 7.5 Minute Series, 1967, Photorevised 1972.

SCALE

0 ½ 1 MILE

FIGURE 2-1 SITE LOCATION

duration of NML's ownership of the West 78th Circle site, NML's use of the property prior to November 1983, or any previous owners of the site.

The West 78th Circle site was originally developed in 1984 as Stuart Anderson's Cattle Company Restaurants by SAGA, its owner. The restaurant has operated on-site from October 1984 to the present. The Stuart Anderson's Cattle Company Restaurants franchise is currently a division of ARG Enterprises.

On August 15, 1984, during the construction of the restaurant, a number of 5-gallon metal containers were excavated at the site from a trench approximately 8 feet deep. Estimates of the exact number of these containers vary from 2 or 3 (Hoskins 1984) to 25 or 30 (Dullinger 1984). The excavation was being made in the southwestern corner of the site for the installation of a water pipeline and hydrant for the restaurant. John Nelson, Public Health Inspector with the Department of Community Development for the city of Bloomington, and Bob Dullinger, an investigator for MPCA, were notified of the excavation of the metal containers, presumably, by one of the construction workers at the site (Nelson 1989).

According to the notification received by Dullinger, a green and brown viscous liquid, with an odor similar to petroleum, was observed to be draining from some of the excavated containers into the pile of soil that had been excavated to form the trench (Dullinger 1984). Nelson informed Dullinger that, according to aerial photographs, an area approximately 1/2 mile east of the site had been used as a dump for the period of approximately 1930 to 1967, and that pieces of concrete and tires had previously been excavated from this area (Dullinger 1984).

MPCA investigators Dullinger, Gawrys, and Susan Cedarleaf visited the construction area at the West 78th Circle site on August 15, 1984. According to Cedarleaf's report, the backhoe operator at the site confirmed that approximately 20 to 30 metal containers had been excavated from the trench and that some of them were leaking an unknown fluid (Cedarleaf 1984). Cedarleaf reported that only one container was visible at the surface of the pile of earth.

On August 16, 1984, Cedarleaf returned to the West 78th Circle site to collect soil samples from the pile of excavated earth that had allegedly contained the leaking containers. The soil samples collected were

sent to MDH for analysis for volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs). Cedarleaf then informed the project supervisor at the construction site, Larry Hoskins of Torre Construction Company, that the pile of soil that had been removed from the trench could be placed on 6 mm plastic and moved to another location on the site, but that backfilling of the soil into the trench was to be postponed pending soil sample analytical results from MDH (Cedarleaf 1984a). Cedarleaf also requested that any additional containers that might be excavated in the course of construction operations at the site be separated from the soil surrounding them and that MPCA be notified.

On August 20, 1984, Hoskins attempted to contact Dullinger and Cedarleaf in order to obtain MPCA's permission to move the pile of excavated earth to a new location on-site and to backfill the trench with imported fill material. Hoskins was unable to reach either Dullinger or Cedarleaf, so he wrote a letter to Public Health Inspector Nelson, of the city of Bloomington, informing Nelson of the actions he proposed to take at the site and indicating his receptiveness to any suggestions Nelson might offer with regard to those actions (Hoskins 1984). The pile of excavated soil was moved to the western property line on-site, and the trench was filled with imported material so that on-site construction could proceed as scheduled (Hunt 1984).

On September 11, 1984, John Hunt, Director of Design/Project Development for Stuart Anderson's Cattle Company Restaurants, visited the West 78th Circle site. Hunt noted that approximately one month had elapsed since MPCA personnel had first visited the site and collected soil samples for analysis by MDH. Concerned about maintaining the restaurant's construction schedule, Hunt engaged the services of Pace Laboratories, Inc. (Pace), of Minneapolis, Minnesota, to collect samples independently in order to determine whether hazardous wastes were associated with the pile of excavated earth and the residue present in the excavated 5-gallon containers (Hunt 1984).

On September 10, 1984, Pace personnel collected four soil samples from the pile of excavated soil at the site. The samples were analyzed for potential EP toxicity on September 12, 1984, by Pace personnel. Based on the results of the EP toxicity test, Pace concluded in its report that the four soil samples were nonhazardous in terms of pH,

flash point, percent total solids, percent volatile solids, and levels of total cadmium, total chromium, and total lead content (Pace 1984). The Pace report also noted that no more than four to seven "5-gallon pails" had been found at the site. According to the report, most of the containers were crushed and empty, but one contained a residue, which was collected along with one of the soil samples (Pace 1984).

On or around October 2, 1984, the pile of excavated soil was distributed over the western end of the site, and the excavated containers were placed in a municipal dumpster by the on-site construction crew. According to Hunt, these operations were performed at the direction of the Environmental Health Department of Bloomington, upon review of the soil sample analytical results provided by Pace (Hunt 1984).

In a certified letter dated October 23, 1984, Gawrys of MPCA notified Hoskins, the construction project supervisor at the site, that MDH's analysis of the soil samples collected on August 16, 1984, had been completed (Gawrys 1984). According to the letter, MDH had detected toluene (94 µg/g), m-xylene (140 µg/g), 1,1,2-trichloroethylene (8,500 µg/g), and Aroclor 1254 (28.9 mg/kg) in one soil sample collected from the West 78th Circle site.

Gawrys indicated that, because of the hazardous substances detected in the pile of excavated earth on-site, MPCA now required the owner of the site to hire a consultant with experience in evaluating hazardous waste sites. The letter further stipulated that within 15 days the consultant was to submit for MPCA staff approval a plan that would result in a thorough investigation of the site with respect to potential groundwater, surface water, and soil/sediment contamination (Gawrys 1984).

On October 31, 1984, Hunt, of Stuart Anderson's Cattle Company Restaurants, responded in writing to Gawrys's letter of October 23. Hunt presented the favorable results of the EP toxicity test which Pace had performed on samples it had collected from the excavated soil and containers on-site (Pace 1984). Hunt also outlined the subsequent distribution of the soil and the disposal of the containers that had been excavated at the site, stating that the operations had been performed "with direction from Environmental Health" (Hunt 1984).

On December 13, 1984, the site was evaluated by MPCA personnel in the form of a preliminary assessment (PA). According to the PA, the contaminated pile of soil had been spread over the site area and the area was then paved over to form a parking lot for the restaurant (MPCA 1984). According to local, state, and federal file information available to FIT prior to the SSI conducted by FIT on May 16, 1989, no other investigatory work had been done at the site with regard to the excavation of the containers since the PA was submitted to U.S. EPA in December 1984.

According to Patrick Murphy of Stuart Anderson's Cattle Company Restaurants, the company has no knowledge of the site's usage prior to its purchase of the property in November 1983 (Murphy 1989). According to Nelson, the boundaries of a neighboring dump area, located to the east of the site, have never extended onto the area of the site (Nelson 1989). However, there is evidence suggesting that the boundary between the site and the nearby dump may not have been well defined. During the collection of soil samples, FIT encountered a former garbage hauler who alleged that dumping had occurred in the area of the marshy northwestern corner of the site. Also, Nelson believes that containers similar to those excavated at the West 78th Circle site have also been discovered at other construction areas near the site (Nelson 1989).

No regulatory or investigative actions are currently being taken by any state agencies with regard to the 1984 excavation of the containers at the West 78th Circle site.

3. SCREENING SITE INSPECTION PROCEDURES AND FIELD OBSERVATIONS

3.1 INTRODUCTION

This section outlines procedures and observations of the SSI of the West 78th Circle site. Individual subsections address the site representative interview, reconnaissance inspection, and sampling procedures. Rationales for specific FIT activities are also provided. The SSI was conducted in accordance with the U.S. EPA-approved work plan, with the exception that no industrial/residential wells were sampled. Industrial/residential wells located near the site were not available for sampling. FIT learned through several telephone conversations with property owners near the site, that nearby properties, which according to Minnesota Geological Survey well logs, had once used private wells, are now served by municipal water supplies from Bloomington and Edina. The private wells have since been capped (Roberts Properties, Inc., et al. 1989).

The U.S. EPA Potential Hazardous Waste Site Inspection Report (Form 2070-13) for the West 78th Circle site is provided in Appendix B.

3.2 SITE REPRESENTATIVE INTERVIEW

Stanley Senger, FIT team leader, conducted an interview with Patrick Murphy, Director of Construction for Stuart Anderson's Cattle Company Restaurants. The interview was conducted on May 16, 1989, at 8:15 a.m. in the restaurant on-site. Also present at the interview was Kurt Sims of FIT.

Douglas Streiber, Wastewater Section Supervisor of Pace, arrived at the end of the interview. Streiber was hired by the site representative

to act as environmental consultant to Stuart Anderson's Cattle Company Restaurants throughout the SSI. The interview was conducted to gather information that would aid FIT in conducting SSI activities.

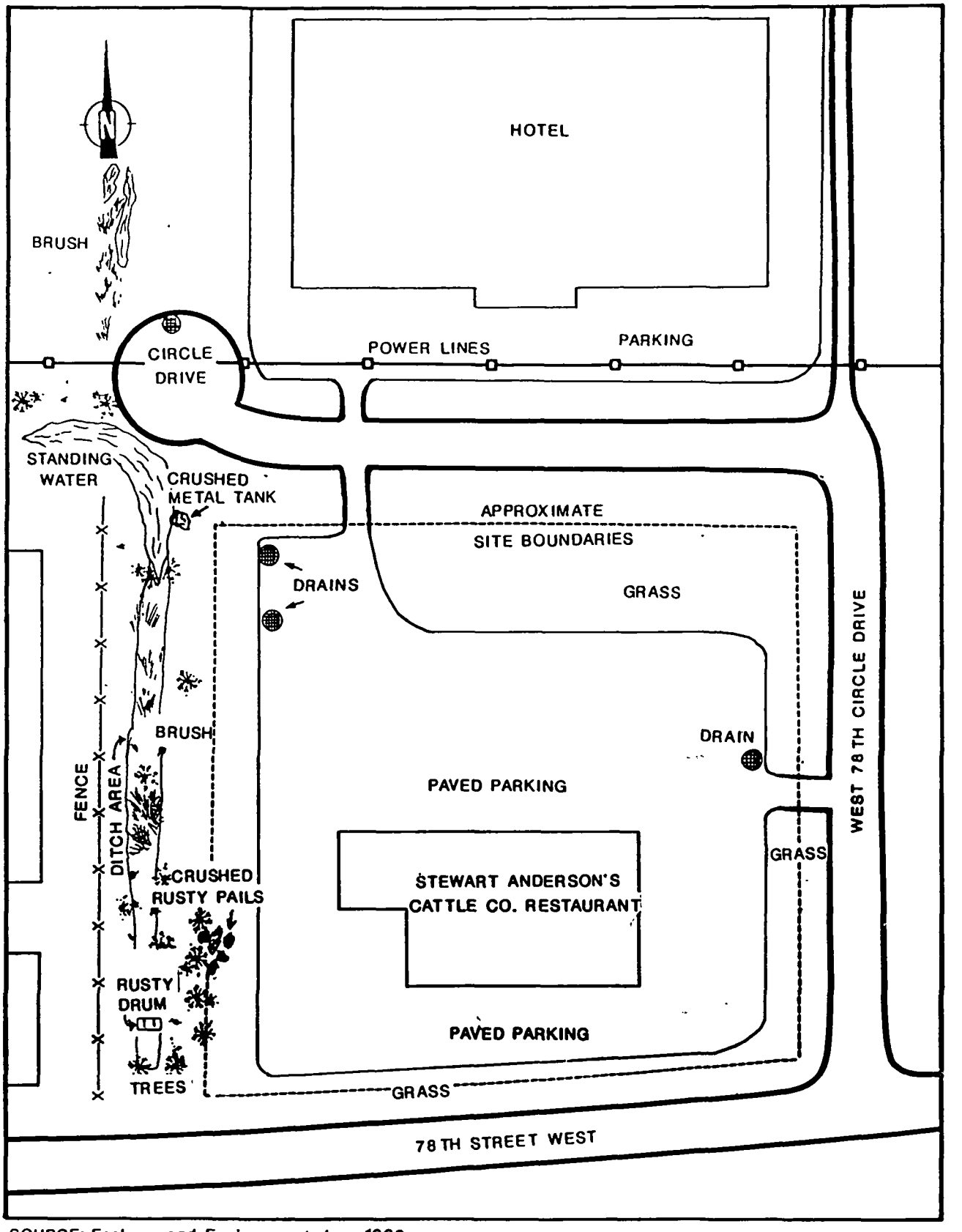
3.3 RECONNAISSANCE INSPECTION

Following the site representative interview, FIT conducted a reconnaissance inspection of the West 78th Circle site and surrounding area. The reconnaissance inspection was conducted in accordance with Ecology and Environment, Inc. (E & E), health and safety guidelines. The inspection include a walk-through of the site to determine appropriate health and safety requirements for conducting on-site activities and to make observations to aid in characterizing the site. FIT also determined exact on-site sampling locations during the reconnaissance inspection.

The reconnaissance inspection began on May 16, 1989, at 9:55 a.m. FIT was unaccompanied throughout the entire reconnaissance portion of the SSI, but was accompanied by Murphy and Streiber throughout the remainder of the SSI of the West 78th Circle site.

Reconnaissance Inspection Observations. The West 78th Circle site consists of a restaurant building and a large parking lot situated on approximately 2 1/3 acres of property located at 4470 West 78th Circle Drive, in Bloomington, Minnesota. The site is almost entirely covered by the parking lot and the restaurant, with the exception of mounded grassy areas along the site's northern, eastern, and southern perimeters, and a ditch/drainage area located along the site's western perimeter (see Figure 3-1 for locations of site features).

The ditch slopes slightly toward the lower elevations at the northwestern corner of the site, and is fairly heavily vegetated with trees at the southern end, grading through brush and marsh-like vegetation to brush and standing water at the northern end. At the southern end of the ditch, FIT noted the following debris protruding through the ground surface: four crushed and rusted 5-gallon metal containers, one empty and rusted 55-gallon metal drum, three tires, a length of 1-inch-diameter steel pipe, and one telephone pole. At the northern end of the ditch, FIT observed what appeared to be a crushed metal storage tank



SOURCE: Ecology and Environment, Inc. 1990.

SCALE

0 100 200 300 400 FEET

FIGURE 3-1 SITE FEATURES

protruding through the ground surface, adjacent to a pool of standing water located in the northwestern corner of the site.

Murphy informed FIT after the reconnaissance inspection that the company does not own the entire ditch area west of the site, but that he believes the property boundaries extend only approximately 4 to 10 feet beyond the western edge of the on-site parking lot. Murphy also stated that he did not know who owns the remainder of the ditch area. Beyond the ditch, farther west of the site, a fence separates the neighboring property, ADC Company, a telecommunications equipment manufacturing company, from the site.

West 78th Circle Drive borders the site on the north and east. The restaurant parking lot has an entrance along each of these boundaries. A newly built hotel is situated on the property across West 78th Circle Drive to the north of the site. Across the drive to the east of the site lie three other businesses: Aztec Industries, J. L. Incorporated, and Hiawatha Corporation. South of the site lies 78th Street West. Farther south lies Interstate Highway I-494.

The site topography is mostly level, with the curbed parking lot and landscaped portions of the site draining into storm sewers located near both entrances to the lot. The only area that does not drain into storm sewer drains is the ditch area along the site's western boundary. Surface drainage within this ditch is toward the north. The overall site slope is toward the north at an approximately 3% grade.

According to Murphy, the restaurant on-site was built on pilings that extend down to bedrock (Murphy 1989). The pilings were necessary because of a thick layer of peat moss beneath the entire area of the site (Nelson 1989). Murphy claims that the presence of the peat moss has caused the pavement of the parking lot to subside, so that annual repairs to the asphalt surface of the lot have been necessary. Since its construction in 1984, the parking lot near the northwestern corner of the restaurant has settled approximately 3 feet away from the building (Murphy 1984).

Photographs of the West 78th Circle site are provided in Appendix C.

3.4 SAMPLING PROCEDURES

Soil samples were collected by FIT at locations selected during the reconnaissance inspection to determine whether U.S. EPA Target Compound List (TCL) compounds and U.S. EPA Target Analyte List (TAL) analytes were present at the site. The TCL and TAL, with corresponding quantitation/detection limits, are provided in Appendix D.

On May 16, 1989, FIT collected four soil samples at the West 78th Circle site and one potential background soil sample from a location near the site. A portion of each soil sample collected on-site was offered to the site representatives. Pace consultant Streiber accepted the site representative's portion of each sample for analysis by Pace.

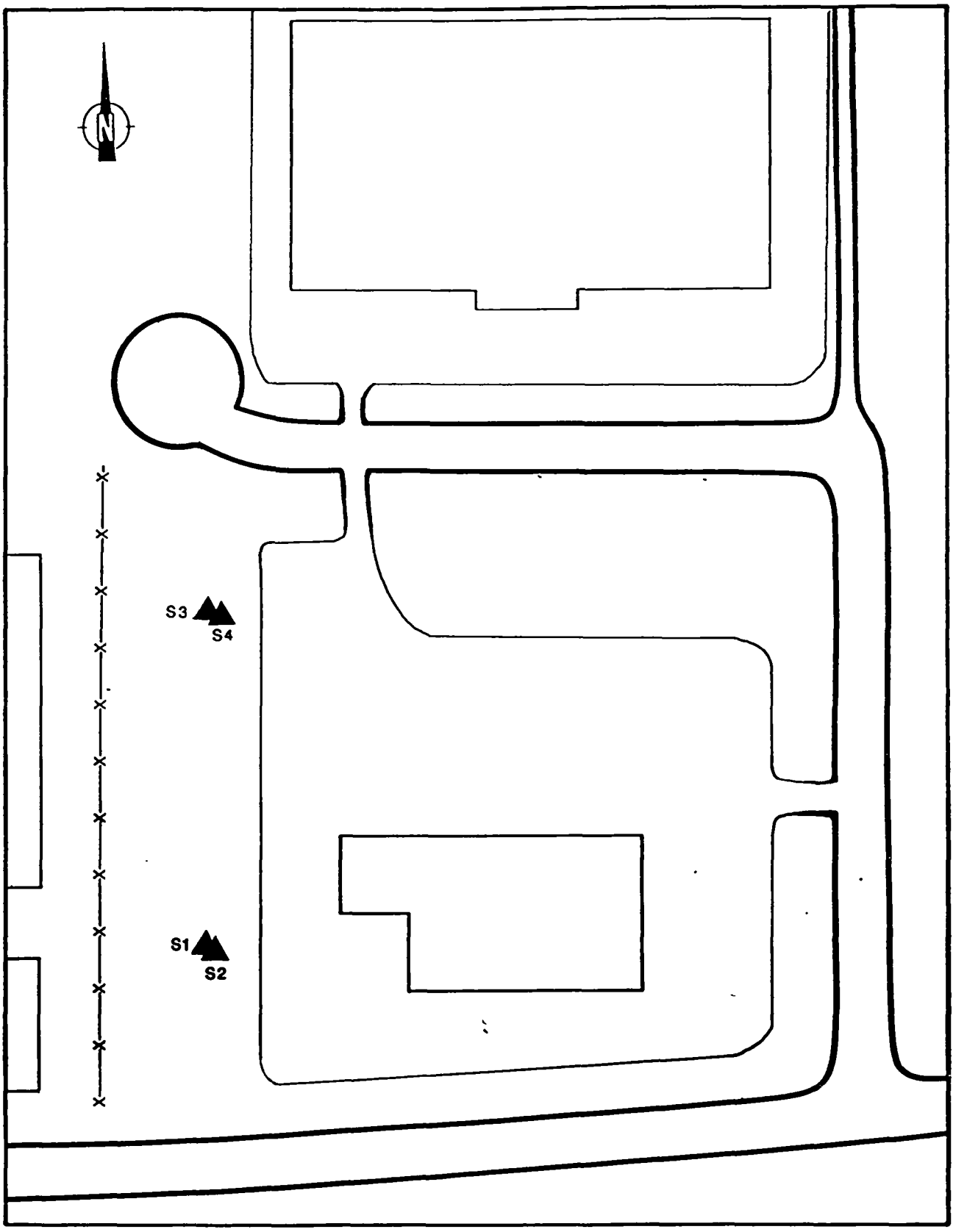
Soil Sampling Procedures. Soil sample S1 was collected from the southern end of the ditch located along the western boundary of the site. The sample was collected approximately 20 feet west of the parking lot on-site (see Figure 3-2 for on-site soil sampling locations).

The location of soil sample S1 was chosen for its proximity to the site of the original excavation of the metal containers in 1984, and for its proximity to the debris observed during the reconnaissance inspection. Soil sample S1 was collected at a depth of 0 to 12 inches. FIT noted that the groundwater level was within 12 inches of the surface at this location.

Soil sample S2 was collected at the same location as S1, but was collected at a depth of approximately 2 to 4 feet. FIT noted that sample S2 was composed predominantly of peat moss and contained only a small amount of soil material.

Soil sample S3 was collected from the northern end of the ditch located along the western boundary of the site. This location was chosen because it was slightly downgrade of the location of the original excavation of the containers on-site. As in the cases of samples S1 and S2, sampling location S3 was approximately 20 feet west of the parking lot on-site. Soil sample S3 was collected at a depth of 0 to 12 inches. FIT noted that the groundwater level was within 12 inches of the surface at this location.

Soil sample S4 was collected at the same location as S3 but was collected at a depth of approximately 2 to 4 feet. As in the case of



SOURCE: Ecology and Environment, Inc. 1990.

SCALE

0 100 200 300 400 FEET

FIGURE 3-2 ON-SITE SOIL SAMPLING LOCATIONS

soil sample S2, sample S4 was composed predominantly of peat moss and contained only a small amount of soil material.

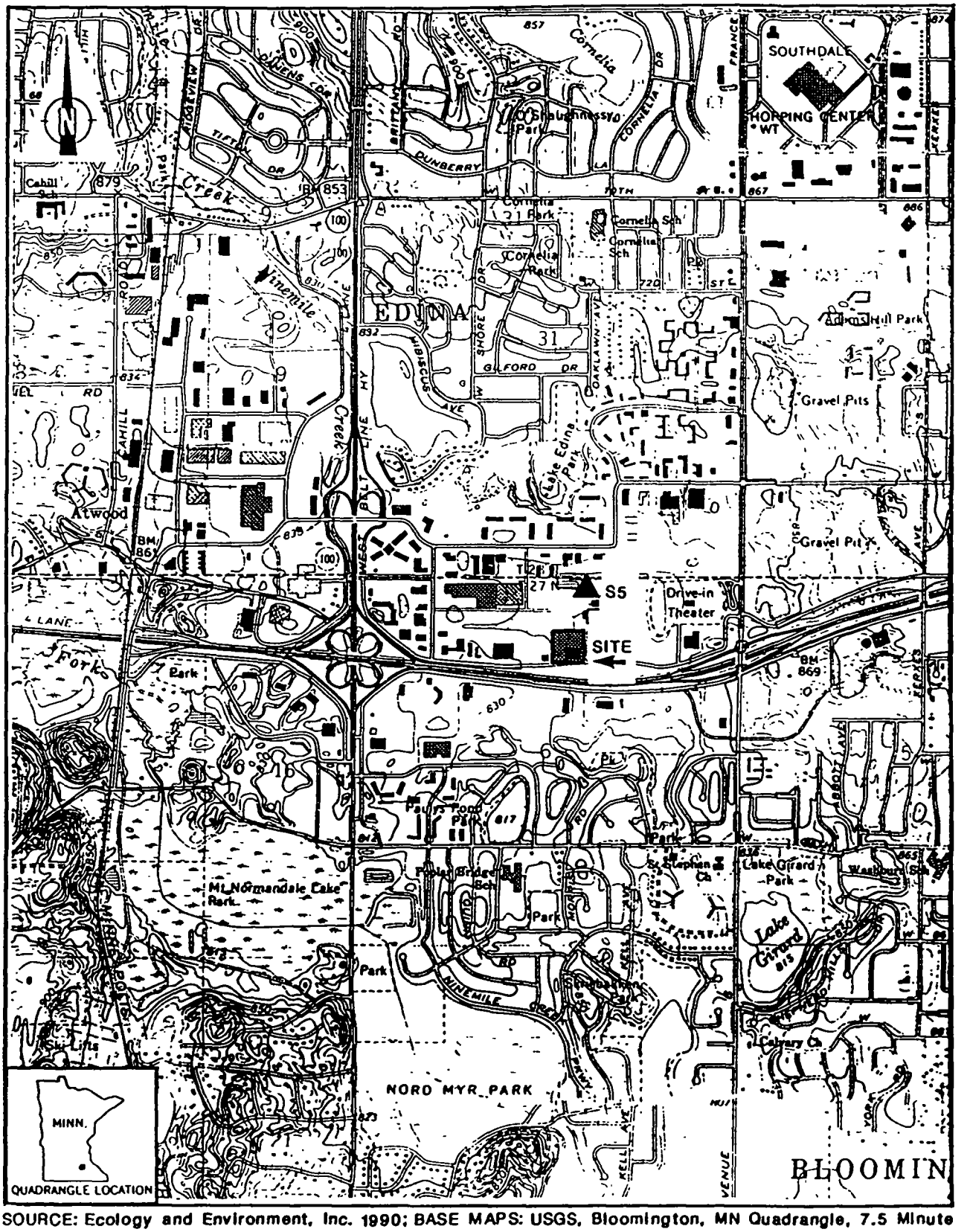
Soil sample S5 was collected from an apparently undisturbed wooded area located approximately 1,000 feet northeast of the site (see Figure 3-3 for off-site soil sampling location). Soil sample S5 was collected as a potential background soil sample to aid FIT in the determination of background chemical characteristics of soils in the area surrounding the West 78th Circle site. Sample S5 was collected at a depth of 0 to 12 inches.

Shallow soil samples S1 and S3 were collected using stainless steel hand trowels, stainless steel bowls, and stainless steel spoons. A hole 4 to 6 inches deep was excavated, using a hand trowel. The portion of each sample to be analyzed for volatile organic compounds (VOCs) was transferred directly from the hole into the VOC sample bottles. The remaining portion of each sample was then placed into a stainless steel bowl, mixed, and transferred with a stainless steel spoon to the remaining sample bottles (E & E 1987).

Deep soil samples S2 and S4 were collected by first excavating a hole approximately 2 feet deep with a posthole digging tool. A split-spoon soil sampling device was then driven down into the soil to remove a soil column from a depth of 2 to 4 feet. A portion of each soil column was then transferred with a stainless steel spoon or hand trowel directly into VOC sample bottles. The remainder of each soil column was then placed into a stainless steel bowl, mixed, and transferred to the remaining sample bottles, using a stainless steel spoon or hand trowel (E & E 1987).

Standard E & E decontamination procedures were adhered to during the collection of all soil samples. The split spoon, the posthole digging tool, and the stainless steel trowels, bowls, and spoons were scrubbed with a solution of Alconox detergent and distilled water, and triple-rinsed with distilled water before the collection of each soil sample. All soil samples were packaged and shipped in accordance with U.S. EPA-required procedures.

As directed by U.S. EPA, all soil samples were analyzed under the U.S. EPA Contract Laboratory Program (CLP) for TCL compounds by Laucks



SOURCE: Ecology and Environment, Inc. 1990; BASE MAPS: USGS, Bloomington, MN Quadrangle, 7.5 Minute Series, 1967, Photorevised 1972 and 1980; Minneapolis South, MN Quadrangle, 7.5 Minute Series, 1967, Photorevised 1972.

SCALE
0 ½ 1 MILE

FIGURE 3-3 OFF-SITE SOIL SAMPLING LOCATION

Testing Laboratories, Inc., of Seattle, Washington, and for TAL analytes by Wilson Laboratories of Salina, Kansas.

4. ANALYTICAL RESULTS

4.1 INTRODUCTION

This section includes results of chemicals analysis of FIT-collected soil samples for TCL compounds and TAL analytes.

4.2 RESULTS OF CHEMICAL ANALYSIS OF FIT-COLLECTED SAMPLES

Chemical analysis of FIT-collected soil samples revealed substances from the following groups of TCL compounds: common laboratory artifacts, PCBs, polyaromatic hydrocarbons, and pesticides. Chemical analysis of FIT-collected soil samples also revealed the presence of TAL analytes, including heavy metals and common soil constituents (see Table 4-1 for complete soil sample chemical analysis results).

FIT-collected soil samples also revealed the presence of numerous tentatively identified compounds (TICs). Many of these TICs possess characteristics commonly found in oily substances.

U.S. EPA CLP quantitation/detection limits are provided in Appendix D.

Table 4-1
RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED SOIL SAMPLES

Sample Collection Information and Parameters	Sample Number S1	S2	S3	S4	S5
Date	5/16/89	5/16/89	5/16/89	5/16/89	5/16/89
Time	1020	1045	1135	1150	1230
CLP Organic Traffic Report Number	EEA18	EEA19	EEA20	EEA21	EEA22
CLP Inorganic Traffic Report Number	MEDT67	MEDT68	MEDT69	MEDT70	MEDT71
Compound Detected (values in µg/kg)					
Volatile Organics					
methylene chloride	--	27J	3J	27J	--
acetone	--	180	34	--	--
tetrachloroethene	--	--	--	39J	--
Semivolatile Organics					
phenanthrene	--	700J	--	--	--
fluoranthene	970	680J	--	--	--
pyrene	850J	520J	--	--	--
benzo[a]anthracene	480J	290J	--	--	--
chrysene	500J	360J	--	--	--
bis(2-ethylhexyl)phthalate	170J	280J	55J	390J	110J
benzo[b]fluoranthene	590J	410J	--	--	--
benzo[k]fluoranthene	490J	290J	--	--	--
benzo[a]pyrene	500J	--	--	--	--
indeno[1,2,3-cd]pyrene	240J	--	--	--	--
benzo[g,h,i]perylene	210J	--	--	--	--
Pesticides/PCBs					
4,4'-DDE	330	--	--	--	170
4,4'-DDD	26J	--	--	--	270
4,4'-DDT	230	--	--	--	1,800
Aroclor 1254	390J	--	--	--	--

Table 4-1 (Cont.)

Sample Collection Information and Parameters	Sample Number S1	S2	S3	S4	S5
Analyte Detected (values in mg/kg)					
aluminum	3,180	676	1,960	903	387
arsenic	6.2	--	2.0B	--	--
barium	174	105B	42.9B	80.3B	247
calcium	32,200	23,600	44,100	16,500	255,000
chromium	13.8	--	6.9	--	--
copper	81.9	44.9	16.8J	35.1	12.1JB
iron	14,800	3,340	6.140	4,260	2,790
lead	146	11.4	3.8	--	27.3
magnesium	5,380	--	12,900	111	7,680
manganese	721	61.4	347	--	497
nickel	--	--	9.7B	--	--
vanadium	11.3B	24B	9.9B	--	14B
zinc	561	14.1B	19.5	--	--

-- Not detected.

Table 4-1 (Cont.)

COMPOUND QUALIFIER	DEFINITION	INTERPRETATION
J	Indicates an estimated value.	Compound value may be semiquantitative.

ANALYTE QUALIFIERS	DEFINITION	INTERPRETATION
B	Value is real, but is above instrument DL and below CRDL.	Value may be quantitative or semi-quantitative.
J	Value is above CRDL and is an estimated value because of a QC protocol.	Value may be semiquantitative.

Source: Ecology and Environment, Inc. 1990.

5. DISCUSSION OF MIGRATION PATHWAYS

5.1 INTRODUCTION

This section contains a discussion of data and information that apply to potential migration pathways and targets of TCL compounds and/or TAL analytes that may be attributable to the West 78th Circle site. The five migration pathways of concern discussed are groundwater, surface water, air, fire and explosion, and direct contact.

5.2 GROUNDWATER

No groundwater samples were collected during the SSI of the West 78th Circle site.

A potential does exist for TCL compounds and TAL analytes to migrate from the site to groundwater in the vicinity of the site. This potential is low, based on the following information.

- TCL compounds, including a trace concentration of Aroclor 1254, and TAL analytes were detected in soil samples collected by FIT during the SSI of the site. However, these TCL compounds and TAL analytes were either detected at low concentrations, were also detected in the potential background soil sample, or can be considered common soil constituents.

- Soil samples collected and analyzed in 1984 revealed the presence of four TCL compounds in soil excavated at the site. The compounds included Aroclor 1254 (MDH 1984). The

Pace analysis of samples collected in 1984 from the excavated soil on-site revealed that the soil samples were not EP toxic with respect to pH, flash point, volatile solids, cadmium, chromium, and lead (Pace 1984).

- FIT noted, while collecting soil sample S1 on-site, that the soil was saturated with water within 12 inches of the surface. However, because the particular TCL compounds and TAL analytes detected on-site tend to fix to clayey soil such as that found in the area of the site, and because of the nature of the geology in the area of the site, the potential for migration of these substances to a drinking water source in the vicinity of the site is low.

The geology of the area within a 3-mile radius of the site consists of approximately 120 to 300 feet of glacial drift. Well logs representative of the area of the site (provided in Appendix E) indicate that this glacial drift is approximately 170 feet thick near the site and is composed predominantly of clay till with some interspersed sand and gravel deposits. Well logs of the area of the site also indicate the presence of a layer of peat moss, 18 to 45 feet thick, just beneath the surface in the vicinity of the site.

The glacial drift is hydraulically connected to a layer of Ordovician age St. Peter sandstone. Within a 3-mile radius of the site, the St. Peter sandstone is highly discontinuous, ranging from approximately 0 to 80 feet thick (U.S. Geological Survey [USGS] 1984). Well logs indicate that the St. Peter sandstone is not present directly beneath the site.

Directly beneath the glacial drift in areas where the St. Peter sandstone is not present, and beneath the St. Peter sandstone within a 3-mile radius the site, lies a continuous layer of Ordovician age dolomite of the Prairie du Chien Group. The dolomite is approximately 80 to 170 feet thick within a 3-mile radius of the site (Minnesota Geological Survey [MNGS] 1985). Well logs from the vicinity of the site indicate the presence of the dolomite beneath the site at a depth of approximately 170 feet and a thickness of approximately 130 feet.

Underlying the dolomite of the Prairie du Chien Group is a continuous layer of Cambrian age Jordan sandstone. Within a 3-mile radius of the site, the Jordan sandstone layer varies from 85 to 110 feet in thickness (MNGS 1985). Well logs from the vicinity the site indicate the presence of the Jordan sandstone at a depth of approximately 300 feet and a thickness of approximately 100 feet.

Beneath the Jordan sandstone unit lies a confining layer of Cambrian age St. Lawrence shale, ranging in thickness from 35 to 75 feet (MNGS 1985).

The aquifer of concern (AOC) within a 3-mile radius of the site is made up of the entire thickness of glacial drift, the St. Peter sandstone (where present), the Prairie du Chien dolomite, and the Jordan sandstone that overlies the confining layer of St. Lawrence shale.

The direction of groundwater movement beneath the site is generally toward the Minnesota River, located southeast of the site (USGS 1984). However, technical reports concerning the movement of groundwater within the Prairie du Chien dolomite portion of the AOC indicate that the localized direction of groundwater flow within that unit becomes complex because of the presence of fractures, joints, and solution channels within the dolomite (USGS 1984). Based on area well logs, the depth to the AOC in the site area is estimated to be approximately 21 feet.

Within a 3-mile radius of the site, drinking water is drawn from the AOC by the cities of Bloomington and Edina. Bloomington has four municipal wells, three of which draw water from the Prairie du Chien dolomite and Jordan sandstone at total depths ranging from 376 to 429 feet as measured to the bottom of each well. The fourth well extends beyond the St. Lawrence shale to a finished depth of 950 feet, drawing water from the Hinckley sandstone aquifer (pre-Cambrian). Water from the Bloomington wells is blended prior to distribution, and serves a population of 84,000 persons (Garrett 1989).

The city of Edina has a total of 18 municipal supply wells, but only 9 of these wells are located within a 3-mile radius of the site. Of Edina's 18 municipal wells, 2 are finished in the Hinckley sandstone aquifer at depths of greater than 1,000 feet. The remainder are

finished in the Jordan sandstone at depths ranging from approximately 400 to 500 feet, as measured to the bottom of each well. Water from Edina's municipal wells is blended prior to distribution, and serves a total population of 46,000 persons (Pelinka 1989).

A number of private drinking water wells are present in Edina, some of which are finished in sand and gravel lenses within the glacial drift that overlies the bedrock portion of the AOC. Edina water department representatives were unable to specify the exact number or locations of these wells, but they estimate that a total of approximately 2,000 households are served by private wells (Pelinka 1989). Well logs on file at MNGS indicate that the shallowest of these private wells is greater than 75 feet deep, thereby penetrating the St. Peter sandstone or Prairie du Chien dolomite of the AOC.

Approximately 1/2 of the city of Richfield lies within the 3-mile radius of the West 78th Circle site, but all of Richfield's municipal wells are located beyond the 3-mile radius of the site. Richfields's wells are all finished within the Jordan sandstone and deeper Hinckley sandstone. Water from these wells is blended prior to distribution and serves a population of about 37,000 persons (Preston 1988).

A small portion of the city of Minneapolis also extends to within the 3-mile radius of the site, but the source of the city's drinking water is the Mississippi River, located approximately 15 miles northeast of the site. Small portions of Bloomington and Edina obtain their drinking water from the Minneapolis water system (Allison 1989).

The potential target population for groundwater contamination includes approximately 135,020 persons served by municipal and private wells drawing from the AOC within a 3-mile radius of the site. This estimate includes the 130,000 persons served by the municipal water systems of Bloomington and Edina. It also includes the 5,020 persons served by the estimated 2,000 private wells located in Edina. This figure was calculated using the 1980 Census average of 2.51 persons per household for Hennepin County (U.S. Bureau of the Census 1982), multiplied by the estimated 2,000 Edina households using private wells (Pelinka 1989).

5.3 SURFACE WATER

No surface water samples were collected during the SSI of the West 78th Circle site. The nearest surface water bodies to the site are small lakes located in Lake Edina Park, 1/4 mile north of the site, and in Paulys Pond Park, 1/4 mile south of the site. According to USGS topographic maps of the area and observations made by FIT at the time of the SSI, no route exists for surface water migration to these lakes, because the West 78th Circle site is located within a closed depression (USGS 1967).

FIT observed a small area of standing water near the northwestern corner of the site, which, according to the site representatives, is present only on a seasonal basis (Murphy 1989). The drains situated in the site's parking lot discharge into the city storm sewer system north and east of the site (Murphy 1989).

5.4 AIR

A release of potential contaminants to the air was not documented during the SSI of the West 78th Circle site. During the reconnaissance inspection, FIT site-entry instruments (OVA 128, explosimeter, oxygen meter, hydrogen cyanide monitor, and radiation monitor) did not detect levels above background concentrations at the site (E & E 1987). In accordance with the U.S. EPA-approved work plan, further air monitoring was not conducted by FIT.

A potential exists for windblown contaminants to migrate off-site, based on the fact that TCL compounds and TAL analytes were detected in surface soil samples collected on-site. This potential is low, however, because the entire site is covered by the on-site building, the parking lot, or by brushy, grassy, or weedy vegetation.

The population within a 4-mile radius of the site is approximately 130,745 persons. This estimate was obtained using USGS topographic maps of the area (USGS 1967) in conjunction with planimeter readings of the densely populated municipalities of Bloomington, Richfield, Edina, Minneapolis, and Eden Prairie.

5.5 FIRE AND EXPLOSION

During the SSI of the West 78th Circle site, no evidence of fire or explosive conditions was observed. FIT explosimeter readings indicated no apparent potential for explosions at the site.

5.6 DIRECT CONTACT

According to state and federal file information reviewed by FIT, and an interview with site representatives, no documentation of any incident involving direct contact of TCL compounds and/or TAL analytes exists for the West 78th Circle site (Murphy 1989).

However, there is a potential for the public to come into direct contact with TCL compounds and TAL analytes detected at the site, based on the following information:

- TCL compounds and TAL analytes were detected in on-site soils;
- A large number of individuals visit the restaurant on-site on a daily basis, and approximately 50 employees currently work at the site (Murphy 1989); and
- No fence or similar structure exists to prevent public access to the area of the site where TCL compounds and TAL analytes have been detected.

The potential for the public to come into direct contact with TCL compounds and/or TAL analytes detected in on-site soils is low because the entire site is covered by the building, the parking lot, or by brushy, grassy, or weedy vegetation.

The population within a 1-mile radius of the site is approximately 8,046 persons. This estimate was obtained by taking a house count from USGS topographic maps of the area of the site (USGS 1967), and multiplying this figure by a persons-per-household average of 2.51 (U.S. Bureau of the Census 1982). Within the municipal limits of Bloomington and Edina, planimeter readings were used to determine the population within the 1-mile radius of the site.

6. REFERENCES

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3922:6

APPENDIX A

SITE 4-MILE RADIUS MAP

SDMS US EPA Region V

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FOUR OR FIFTEEN MILE RADIUS MAP

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APPENDIX B

U.S. EPA FORM 2070-13

Site Inspection Report

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MND	980995872

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
WEST 78th CIRCLE SITE	4470 W. 78th Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
BLOOMINGTON	MN	55435	Hennepin	053	03

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
44°51'40.0	093°21'05.0	☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
05 16 89 (MONTH DAY YEAR)	☒ ACTIVE ☐ INACTIVE	1984 (BEGINNING YEAR) Active (ENDING YEAR) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☒ B. EPA CONTRACTOR (E&E) Ecology & Environment, Inc. (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO
STANLEY A. SENGER	WATER RESOURCE MGR.	E&E	(312) 663-9415

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
KURT SIMS	EARTH SCIENTIST	E&E	( ) SAME
DANIEL SULLIVAN	CHEMICAL ENGINEER	E&E	( ) SAME
RON GALMORE	TECHNICIAN	E&E	( ) SAME
DEBORAH BARRETT	GEOLOGIST	E&E	( ) SAME
MICHAEL PHILLIPS	GEOLOGIST	E&E	( ) SAME

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
PATRICK J. MURPHY	DIRECTOR OF CONSTRUCTION	STUART ANDERSON'S Restaurants, 4440 El Camino Real Suite 201, Los Altos, CA 94022	(415) 949-6400
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	0800 hrs	CLEAR & SUNNY, Temp. range 67°F - 83°F (High), @ 75°F, Lt. BREEZE → N.E. @ 5 mph.

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
RON SWENSON	MPCA, St. Paul, MN	(612) 297-1793

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
STANLEY A. SENGER	U.S. EPA	E&E, INC.	(312) 663 9415	09 05 89 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
IIIND	980995872

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A SOLID
- [ ] B POWDER FINES
- [ ] C SLUDGE
- [ ] D OTHER _____ (Specify)
- [ ] E SLURRY
- [X] F LIQUID
- [ ] G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS: UNKNOWN

CUBIC YARDS: _____

NO. OF DRUMS: _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A TOXIC
- [ ] B CORROSIVE
- [ ] C RADIOACTIVE
- [X] D PERSISTENT
- [ ] E SOLUBLE
- [ ] F INFECTIOUS
- [ ] G FLAMMABLE
- [ ] H IGNITABLE
- [ ] I HIGHLY VOLATILE
- [ ] J EXPLOSIVE
- [ ] K REACTIVE
- [ ] L INCOMPATIBLE
- [ ] M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES	UNKNOWN		TCL Compounds and TAL analytes
OCC	OTHER ORGANIC CHEMICALS	UNKNOWN		noted in soil samples collected on-site
IOC	INORGANIC CHEMICALS			on 5/16/89.
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	UNKNOWN		

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
*	SEE TABLE 4-1 for list of TCL compounds and TAL analytes detected in soil samples collected on-site.				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	NONE		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis reports)

E & E, INC. Site Inspection & Interview, 5/16/89

E & E/FIT FILES, REGION II, Chicago, IL

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MND	980995872

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 135,020
02 ☐ OBSERVED (DATE _____) [X] POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE NARRATIVE DESCRIPTION, Section 5.2 GROUNDWATER.

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: N/A
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE Narrative Description, Section 5.3, SURFACE WATER.

01 [X] C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: 130,745
02 ☐ OBSERVED (DATE: _____) [X] POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE Narrative Description, Section 5.4, AIR.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: N/A
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE Narrative Description, Section 5.5, FIRE and Explosion.

01 [X] E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: 8,046
02 ☐ OBSERVED (DATE: _____) [X] POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE NARRATIVE DESCRIPTION, Section 5.6, DIRECT CONTACT.

01 [X] F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: @ ⅓ acre (Acres)
02 [X] OBSERVED (DATE 5/16/89) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE Narrative Description, Sections 4.2, Results of Chemical Analysis of FIT-Collected Soil Samples, and 5.2, Groundwater.

01 [X] G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 135,020
02 ☐ OBSERVED (DATE: _____) [X] POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE "A." above.

01 [X] H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: 50
02 ☐ OBSERVED (DATE: _____) [X] POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE Narrative Description, Section 5.6, DIRECT CONTACT.

01 [X] I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: 135,020
02 ☐ OBSERVED (DATE: _____) [X] POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

SEE SECTIONS A, C, D, E and G above.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MND	980995872

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
None documented or observed during SSI.

01 ☒ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)
None documented or observed during SSI.

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
None documented or observed during SSI.

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids Leaking drums) — 02 ☒ OBSERVED (DATE 8/15/84) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED 135,020 — 04 NARRATIVE DESCRIPTION
Excavation of several buried metal containers during construction operations at site revealed presence of oily waste material... analysis by MN. Dept. of Health showed presence of Arochlor 1254, Toluene, M-Xylene, and 1,1,2 trichloroethylene.

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
None documented or observed during SSI.

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
None documented or observed during SSI.

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
None documented or observed during SSI. SEE Narrative Description for Reconnaissance Inspection Observations, Section 3.3.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
Current restaurant facility may have been developed on top of what was once a dump site or an unclean fill site.

III. TOTAL POPULATION POTENTIALLY AFFECTED: Within 4-mile radius = 130,745 persons.

IV. COMMENTS

N/A

V. SOURCES OF INFORMATION (Cite specific references e.g., state files, sample analysis, reports)

E&E Site Inspection and Interview, 5/16/89
E&E, Inc./FIT FILES, Region V, Chicago, IL.

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MND	980995872

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☒ J. NONE	NONE			

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER (Specify) UNKNOWN, previous disposal practices.		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☒ H. OTHER (Specify) NONE

05 OTHER

☒ A. BUILDINGS ON SITE
ONE

06 AREA OF SITE

2.36 (Acres)

07 COMMENTS

Overall site acreage is 2.36 acres; however, only a small portion of this (@ 1/3 acre) is not covered by on-site building or parking lot (asphalt). Prior to 1984, site remained undeveloped.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

In area where the containers were originally excavated on the site, an asphalt parking lot now covers the property. According to info. on file with MPCA and U.S. EPA, the pile of earth which was originally thought to contain TCL compounds/contamination, was spread onto grounds surface and covered with the asphalt paving material of the parking lot.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE ☒ YES ☐ NO

02 COMMENTS

TCL compounds and TAL analytes were detected in soil samples collected on-site from depths of 0-12 inches.

VI. SOURCES OF INFORMATION (Cite specific references e.g. state files, sample analysis reports)

E & E, Inc. Site Inspection and Interview, 5/16/89.
E & E, Inc./FIT FILES, REGION V, Chicago, IL.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MND	980995872

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS	ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A ☐	B. ■		A. ☐	B. ☐	C. ■	A. ½ (mi)
NON-COMMUNITY	C ☐	D ■		D. ☐	E. ☐	F. ☐	B 0-3 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

■ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 135,020

03 DISTANCE TO NEAREST DRINKING WATER WELL ½ (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
@ 21 (ft)	Southeast	21 (ft)	Not determined (gpd)	☐ YES ■ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

See Narrative Description, Section 5.2, groundwater.

10 RECHARGE AREA		11 DISCHARGE AREA	
■ YES ☐ NO	COMMENTS: Slow recharge of aquifer from area precipitation.	■ YES ☐ NO	COMMENTS: Groundwater discharges into Minnesota River @ 5 miles Southeast of site

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

■ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
The site is located in a closed basin of what appears to be an old lake bed.	☐	(mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 8,046 NO OF PERSONS	B. 26,392 NO OF PERSONS	C. 71,416 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION: @ 50 feet

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: @ 10,515

04 DISTANCE TO NEAREST OFF-SITE BUILDING: @ 100 ft.

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

Site is located in suburban Minneapolis. The frontage road adjacent to the site is dominated by commercial businesses, but a large population exists in rental and private dwellings in the entire area surrounding the site.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MND	980995872

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A $10^{-6} - 10^{-8}$ cm/sec ■ B $10^{-4} - 10^{-6}$ cm/sec ☐ C $10^{-4} - 10^{-3}$ cm/sec ☐ D GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ■ C RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
170 (ft)	unknown (ft)	Not determined	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-1.84 (in)	2.35 (in)	@ 2 %	Northwest	≤ 3% %

09 FLOOD POTENTIAL

SITE IS IN N/A YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY No

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. NONE (mi) OTHER: B. 1 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

unknown (mi)

ENDANGERED SPECIES. —

13 LAND USE IN VICINITY

DISTANCE TO.

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS, NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS PRIME AG LAND	AGRICULTURAL LANDS AG LAND
A. Adjacent to (mi)	B. 0.25 (mi)	C. None (mi)	D. None (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

SEE Appendix A, 4-mile radius map of site.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E, Inc. Site Inspection and Interview, 5/16/89.

E & E, Inc./FIT FILES, Region V, Chicago, IL.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MN D	980995872

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
(SOIL)	5	SEE SSI Narrative, Sections 3, 4 and 5.	currently Available
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
O_2 Meter	No deviation from background levels.
Explosimeter	
HCN monitor	
Radiation mini alert	
OVA 128 (Organic Vapor Analyzer)	

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF Ecology & Environment, Inc., Chicago IL. (Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Same as 02 above.

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

None.

VI. SOURCES OF INFORMATION (Cite specific references e.g., state files, sample analysis, reports)

See PART 2 of 2070-13 form, section VI for sources.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MND	980995872

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
ARG Enterprises	N/A	450 Newport Center Dr. 6th floor	N/A	Newport Beach	CA	92660

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P O Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Marriott Corporation	N/A	unknown	N/A	Bethesda,	MD	unknown
SAGA Corporation	N/A	unknown	N/A	Seattle	WA	unknown

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Northwest Mutual Life	N/A	unknown	N/A	unknown	WI	unknown

V. SOURCES OF INFORMATION (Cite specific references, e g , state files, sample analysis reports)

SEE PART 2 of 2070-13 form, section VI for sources.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION
01 STATE: MND | 02 SITE NUMBER: 980995872

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
STUART ANDERSON'S BLACK ANGUS RESTAURANTS	N/A

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
4470 W. 78th Circle	N/A

05 CITY	06 STATE	07 ZIP CODE
Bloomington	MN	55435

08 YEARS OF OPERATION	09 NAME OF OWNER
OCT. 1984 - present (5 years)	ARG ENTERPRISES

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
ARG Enterprises	N/A

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
450 Newport Center Drive 6th Floor	N/A

14 CITY	15 STATE	16 ZIP CODE
Newport Beach,	CA	92660

(714) 721-8000

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
NONE		Marriott Corporation	N/A

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
		unknown	N/A

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
			Bethesda	MD	unknown

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
NONE		SAGA Corporation	N/A

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
		unknown	N/A

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
			SEATTLE	WA.	unknown

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
NONE		None	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Part 2, 2070-13 Form, section VI for additional sources.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MND	980995872

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
NONE	
03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
NONE		None	
03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
None		None	
03 STREET ADDRESS (P O Box, RFD # etc.)	04 SIC CODE	03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
NONE		None	
03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
NONE		None	
03 STREET ADDRESS (P O Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P O Box, RFD # etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e g , state files, sample analysis, reports)

See Part 2, 2070-13 form, section III for sources of information.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: MND | 02 SITE NUMBER: 980995872

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ D. SPILLED MATERIAL REMOVED 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ F. WASTE REPACKAGED 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ H. ON SITE BURIAL 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ● L. ENCAPSULATION 04 DESCRIPTION: pile of contaminated soil was spread over site then paved over with asphalt in area of parking lot on-site.	02 DATE: FALL 1984	03 AGENCY: OWNER
01 ☐ M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ N. CUTOFF WALLS 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION: N/A	02 DATE	03 AGENCY
01 ☐ Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION: N/A	02 DATE	03 AGENCY

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: MND | 02 SITE NUMBER: 98099 5872

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ S CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: SEE "L" above.

01 ☐ T BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ U GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ 1 ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: N/A

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: None

III. SOURCES OF INFORMATION (Cite specific references, e g state files, sample analysis, reports)

SEE PART 2, Form 2070-13, section VI.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MND	980995872

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION [X] YES [ ] NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

SEE SSI Narrative, Section 23, SITE HISTORY.

III. SOURCES OF INFORMATION (Cite specific references, e g , state files, sample analysis, reports)

See Part 2 of Form 2070-13, Section VI.

EPA FORM 2070-13 (7-81)

APPENDIX C

FIT SITE PHOTOGRAPHS

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 1 OF 10

U.S. EPA ID: MND980995872 TDD: F05-8903-001 PAN: FMN0172SA

DATE: MAY 16, 1989 TIME: 1025 DIRECTION OF PHOTOGRAPH: N E PHOTOGRAPHED BY: S.SENGER

WEATHER CONDITIONS: BREEZE→NE, 5 mph ; @75°F, CLEAR SKIES SAMPLE ID (if applicable): N/A

DESCRIPTION: Pan of site from the south west corner of property.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 2 OF 10

U.S. EPA ID: MND980995872 TDD: F05-8903-001 PAN: FMN0172SA

DATE: MAY 16, 1989 TIME: 1255 DIRECTION OF PHOTOGRAPH: W → NW PHOTOGRAPHED BY: S.SENGER

WEATHER CONDITIONS: BREEZE→NE, 5 mph ; @75°F, CLEAR SKIES SAMPLE ID (if applicable): N/A

DESCRIPTION: Panoramic view of site taken from Southeast corner of site.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE

U.S. EPA ID: MND980995872 TDD: F05-8903-001 PAN: FMN0172SA

DATE: MAY 16, 1989 TIME: 1246 DIRECTION OF PHOTOGRAPH: E ↖ S PHOTOGRAPHED BY: S.SENGER

WEATHER CONDITIONS: BREEZE→NE, 5 mph ; @75°F, CLEAR SKIES SAMPLE ID (if applicable): N/A

DESCRIPTION: Panoramic View of site as seen from the Northwest corner of the site.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 4 OF 10

U.S. EPA ID: MND980995872 TDD: F05-8903-001 PAN: FMN0172SA

DATE: MAY 16, 1989

TIME: 1020

DIRECTION OF PHOTOGRAPH: North

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): S1

DESCRIPTION: Close up of S1. Groundwater within 6 inches of surface.

DATE: MAY 16, 1989

TIME: 1020

DIRECTION OF PHOTOGRAPH: North

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): S1

DESCRIPTION: Perspective of S1.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 5 OF 10

U.S. EPA ID: MND980995872 TDD: F05-8903-001 PAN: FMN0172SA

DATE: MAY 16, 1989

TIME: 10:45

DIRECTION OF PHOTOGRAPH: South

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): S2

DESCRIPTION: Close up of S2.

DATE: MAY 16, 1989

TIME: 1045

DIRECTION OF PHOTOGRAPH: Southwest

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): S2

DESCRIPTION: perspective of S2 with empty metal drum in right background.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 6 OF 10

U.S. EPA ID: MND980995872 TDD: FO5-8903-001 PAN: FMNO172SA

DATE: MAY 16, 1989

TIME: 1135

DIRECTION OF PHOTOGRAPH: N/A

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): S3

DESCRIPTION: Close up of S3.

DATE: MAY 16, 1989

TIME: 1140

DIRECTION OF PHOTOGRAPH: North

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): S3

DESCRIPTION: Perspective of S3 showing cattails and wetlands-type vegetation.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 7 OF 10

U.S. EPA ID: MND980995872 TDD: FO5-8903-001 PAN: FMNO172SA

DATE: MAY 16, 1989

TIME: 1150

DIRECTION OF PHOTOGRAPH: N/A

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): 54

DESCRIPTION: Close up of 54.

DATE: MAY 16, 1989

TIME: 1155

DIRECTION OF PHOTOGRAPH: Southwest

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): 54

DESCRIPTION: Perspective of 54 showing vegetation to the south and west of the sample point.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 8 OF 10

U.S. EPA ID: MND980995872 TDD: FO5-8903-001 PAN: FMNO172SA

DATE: MAY 16, 1989

TIME: 1235

DIRECTION OF PHOTOGRAPH: N/A

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): S5

DESCRIPTION: Close up of S5, "Background" soil sample.

DATE: MAY 16, 1989

TIME: 1240

DIRECTION OF PHOTOGRAPH: Southwest

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): S5

DESCRIPTION: Perspective of S5, potential Background sample, collected from wooded area northeast of the West 78th Circle site.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 9 OF 10

U.S. EPA ID: MND980995872 TDD: F05-8903-001 PAN: FMN0172SA

DATE: MAY 16, 1989

TIME: 1204

DIRECTION OF PHOTOGRAPH: South

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): N/A

DESCRIPTION: Photo of ditch area west of site as seen from northeast corner of site.

DATE: MAY 16, 1989

TIME: 1115

DIRECTION OF PHOTOGRAPH: S.W.

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): N/A

DESCRIPTION: Photo of crushed metal object located at northwest end of site (appeared to be a crushed storage tank). Standing water can be seen throughout this area.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: WEST 78th CIRCLE PAGE 10 OF 10

U.S. EPA ID: MND980995872 TDD: F05-8903-001 PAN: FMN0172SA

DATE: MAY 16, 1989

TIME: 1200

DIRECTION OF PHOTOGRAPH: Northeast

WEATHER CONDITIONS: BREEZE→NE, 5 mph @75°F, CLEAR SKIES

PHOTOGRAPHED BY: S.SENGER

SAMPLE ID (if applicable): N/A

DESCRIPTION: Photo of Northwest corner of restaurant on-site showing extent of surface subsidence since built in 1984. Floor of loading ramp was once level with parking lot, which has settled away from the building.

ADDENDUM A

ROUTINE ANALYTICAL SERVICES

CONTRACT REQUIRED DETECTION AND QUANTITATION LIMITS

Contract Laboratory Program
Target Compound List
Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Chloromethane	74-87-3	10 ug/L	10 ug/Kg
Bromomethane	74-83-9	10	10
Vinyl chloride	75-01-4	10	10
Chloroethane	75-00-3	10	10
Methylene chloride	75-09-2	5	5
Acetone	67-64-1	10	5
Carbon disulfide	75-15-0	5	5
1,1-dichloroethene	75-35-4	5	5
1,1-dichloroethane	75-34-3	5	5
1,2-dichloroethene (total)	540-59-0	5	5
Chloroform	67-66-3	5	5
1,2-dichloroethane	107-06-2	5	5
2-butanone (MEK)	78-93-3	10	10
1,1,1-trichloroethane	71-55-6	5	5
Carbon tetrachloride	56-23-5	5	5
Vinyl acetate	108-05-4	10	10
Bromodichloromethane	75-27-4	5	5
1,2-dichloropropane	78-87-5	5	5
cis-1,3-dichloropropene	10061-01-5	5	5
Trichloroethene	79-01-6	5	5
Dibromochloromethane	124-48-1	5	5
1,1,2-trichloroethane	79-00-5	5	5
Benzene	71-43-2	5	5
Trans-1,3-dichloropropene	10061-02-6	5	5
Bromoform	75-25-2	5	5
4-Methyl-2-pentanone	108-10-1	10	10
2-Hexanone	591-78-6	10	10
Tetrachloroethene	127-18-4	5	5
Tolene	108-88-3	5	5
1,1,2,2-tetrachloroethane	79-34-5	5	5
Chlorobenzene	108-90-7	5	5
Ethyl benzene	100-41-4	5	5
Styrene	100-42-5	5	5
Xylenes (total)	1330-20-7	5	5

Table A
Contract Laboratory Program
Target Compound List
Semivolatiles Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Phenol	108-95-2	10 ug/L	330 ug/Kg
bis(2-Chloroethyl) ether	111-44-4	10	330
2-Chlorophenol	95-57-8	10	330
1,3-Dichlorobenzene	541-73-1	10	330
1,4-Dichlorobenzene	106-46-7	10	330
Benzyl Alcohol	100-51-6	10	330
1,2-Dichlorobenzene	95-50-1	10	330
2-Methylphenol	95-48-7	10	330
bis(2-Chloroisopropyl) ether	108-60-1	10	330
4-Methylphenol	106-44-5	10	330
N-Nitroso-di-n-dipropylamine	621-64-7	10	330
Hexachloroethane	67-72-1	10	330
Nitrobenzene	98-95-3	10	330
Isophorone	78-59-1	10	330
2-Nitrophenol	88-75-5	10	330
2,4-Dimethylphenol	105-67-9	10	330
Benzoic Acid	65-85-0	50	1600
bis(2-Chloroethoxy) methane	111-91-1	10	330
2,4-Dichlorophenol	120-83-2	10	330
1,2,4-Trichlorobenzene	120-82-1	10	330
Naphthalene	91-20-3	10	330
4-Chloroaniline	106-47-8	10	330
Hexachlorobutadiene	87-68-3	10	300
4-Chloro-3-methylphenol	59-50-7	10	330
2-Methylnaphthalene	91-57-6	10	330
Hexachlorocyclopentadiene	77-47-4	10	330
2,4,6-Trichlorophenol	88-06-2	10	330
2,4,5-Trichlorophenol	95-95-4	50	1600
2-Chloronaphthalene	91-58-7	10	330
2-Nitroaniline	88-74-4	50	1600
Dimethylphthalate	131-11-3	10	330
Acenaphthylene	208-96-8	10	330
2,6-Dinitrotoluene	606-20-2	10	330
3-Nitroaniline	99-09-2	50	1600
Acenaphthene	83-32-9	10	330
2,4-Dinitrophenol	51-28-5	50	1600
4-Nitrophenol	100-02-7	50	1600
Dibenzofuran	132-64-9	10	330
2,4-Dinitrotoluene	121-14-2	10	330
Diethylphthalate	84-66-2	10	330
4-Chlorophenyl-phenyl ether	7005-72-3	10	330

Table A
Contract Laboratory Program
Target Compound List
Semivolatiles Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SLUDGE SEDIMENT
Fluorene	86-73-7	10 ug/L	330 ug/Kg
4-Nitroaniline	100-01-6	50	1600
4,6-Dinitro-2-methylphenol	534-52-1	50	1600
N-nitrosodiphenylamine	86-30-6	10	330
4-Bromophenyl-phenylether	101-55-3	10	330
Hexachlorobenzene	118-74-1	10	330
Pentachlorophenol	87-86-5	50	1600
Phenanthrene	85-01-8	10	330
Anthracene	120-12-7	10	330
Di-n-butylphthalate	84-74-2	10	330
Fluoranthene	206-44-0	10	330
Pyrene	129-00-0	10	330
Butylbenzylphthalate	85-68-7	10	330
3,3'-Dichlorobenzidine	91-94-1	20	660
Benzo(a)anthracene	56-55-3	10	330
Chrysene	218-01-9	10	330
bis(2-Ethylhexyl)phthalate	117-81-7	10	330
Di-n-octylphthalate	117-84-0	10	330
Benzo(b)fluoranthene	205-99-2	10	330
Benzo(k)fluoranthene	207-08-9	10	330
Benzo(a)pyrene	50-32-8	10	330
Indeno(1,2,3-cd)pyrene	193-39-5	10	330
Dibenz(a,h)anthracene	53-70-3	10	330
Benzo(g,h,i)perylene	191-24-2	10	330

Table A
Contract Laboratory Program
Target Compound List
Pesticide and PCB Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
alpha-BHC	319-84-6	0.05 ug/L	8 ug/Kg
beta-BHC	319-85-7	0.05	8
delta-BHC	319-86-8	0.05	8
gamma-BHC (Lindane)	58-89-9	0.05	8
Heptachlor	76-44-8	0.05	8
Aldrin	309-00-2	0.05	8
Heptachlor epoxide	1024-57-3	0.05	8
Endosulfan I	959-98-8	0.05	8
Dieldrin	60-57-1	0.10	16
4,4'-DDE	72-55-9	0.10	16
Endrin	72-20-8	0.10	16
Endosulfan II	33213-65-9	0.10	16
4,4'-DDD	72-54-8	0.10	16
Endosulfan sulfate	1031-07-8	0.10	16
4,4'-DDT	50-29-3	0.10	16
Methoxychlor (Mariate)	72-43-5	0.5	80
Endrin ketone	53494-70-5	0.10	16
alpha-Chlordane	5103-71-9	0.5	80
gamma-chlordane	5103-74-2	0.5	80
Toxaphene	8001-35-2	1.0	160
AROCLOR-1016	12674-11-2	0.5	80
AROCLOR-1221	11104-28-2	0.5	80
AROCLOR-1232	11141-16-5	0.5	80
AROCLOR-1242	53469-21-9	0.5	80
AROCLOR-1248	12672-29-6	0.5	80
AROCLOR-1254	11097-69-1	1.0	160
AROCLOR-1260	11096-82-5	1.0	160

Table A
Contract Laboratory Program
Target Analyte List
Inorganic Quantitation Limits

COMPOUND	PROCEDURE	SOIL WATER	SEDIMENT SLUDGE
Aluminum	ICP	200 ug/L	40 mg/Kg
Antimony	Furnace	60	2.4
Arsenic	Furnace	10	2
Barium	ICP	200	40
Beryllium	ICP	5	1
Cadmium	ICP	5	1
Calcium	ICP	5000	1000
Chromium	ICP	10	2
Cobalt	ICP	50	10
Copper	ICP	25	5
Iron	Icp	100	20
Lead	Furnace	5	1
Magnesium	ICP	5000	1000
Manganese	ICP	15	3
Mercury	Cold Vapor	0.2	0.008
Nickel	ICP	40	8
Potassium	ICP	5000	1000
Selenium	Furnace	5	1
Silver	ICP	10	2
Sodium	ICP	5000	1000
Thallium	Furnace	10	2
Vanadium	ICP	50	10
Zinc	ICP	20	4
Cyanide	Color	10	2

APPENDIX D

U.S. EPA TARGET COMPOUND LIST AND TARGET ANALYTE LIST QUANTITATION/DETECTION LIMITS

APPENDIX E

WELL LOGS OF THE AREA OF THE SITE

205219 27-24- 6ABDBDD

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MINNESOTA GEOLOGICAL SURVEY
WATER WELL DATA BASE. 87/08/15.

UNIQUE NO.: 205219
WELL NAME : LAKESIDE INDUSTRIES

COUNTY : HENNEPIN DATE ENTERED:
ADDRESS : LEISURE DYNAMICS BLOOMINGTON
QUADRANGLE: BLOOMINGTON 7.5 MINUTE

TOWNSHIP : 27 NORTH UTM-EASTING : 473480
RANGE : 24 WEST UTM-NORTHING: 4967224
SECTION : 6/ABDBDD UTM-ZONE : 15
LATITUDE : 44:51:35 N LONGITUDE : 93:20:08 W
LOCATED BY:

ELEVATION : 830 FT. WATER LEVEL : 30 FT. (EL. 800 FT.)
DEPTH : 220 FT. DATE : 72/06/12
COMPLETED : 72/06/12 AQUIFER(S) : PRAIRIE DU CHIEN GROUP

WELL USE : INDUSTRY
DRILLER : (AND/OR DATA SOURCE) MINN. VALLEY WELL CO
CASING : STEP DOWN
: 006 INCH TO 0177 FEET
SCREEN
MAKE/TYPE: NONE

PUMP : DATA UNAVAILABLE

PUMPAGE TEST

DATE: 72/06	TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6
HOURS						
RATE(GPM)	0400					
DRAWDOWN(FT)	000					

GEOLOGIC LOG

DEPTH INTERVAL (IN FEET)	LITHOLOGY	STRATIGRAPHIC UNIT SYSTEM/GROUP/FORMATION	AGE	HARDNESS	COLOR	DRILLER'S DESCRIPTION
0 1	BASEMENT	RECENT DEPOSIT	REC		LGT-BRN	CEMENT
1 15	FILL	MAN-MADE FILL	REC		BROWN	GRAVEL FILL
15 18	PEAT	LACUSTRINE DEPOSIT	QUA		BLACK	PEAT
18 27	CLAY	TILL	QUA		BLUE	CLAY
27 55	GRAVEL	BROWN FLUVIAL DEPOSIT	QUA		BROWN	COARSE GRAVEL
55 67	CLAY	TILL	QUA		BLUE	CLAY
67 69	GRAVEL	BROWN FLUVIAL DEPOSIT	QUA		BROWN	GRAVEL
69 74	CLAY	TILL	QUA		BLUE	CLAY
74 78	GRAVEL	BROWN FLUVIAL DEPOSIT	QUA		BROWN	GRAVEL

(CONTINUED)

WELL LOG 1

M.G.S. WATER WELL DATA BASE
UNIQUE NO. 205219 - GEOLOGIC LOG (CONTINUED)

DEPTH INTERVAL (IN FEET)	LITHOLOGY	STRATIGRAPHIC UNIT SYSTEM/GROUP/FORMATION	AGE	HARDNESS	COLOR	DRILLER'S DESCRIPTION
74 78	GRAVEL	BROWN FLUVIAL DEPOSIT	QUA		BROWN	GRAVEL
78 94	CLAY,SAND	TILL	QUA		BLUE	CLAY & SAND
94 102	GRAVEL	BROWN FLUVIAL DEPOSIT	QUA		BROWN	GRAVEL COARSE
102 111	GRAVEL,SAND	BROWN FLUVIAL DEPOSIT	QUA		BROWN	GRAVEL & SAND
111 125	CLAY	BROWN TILL	QUA		RED-BRN	CLAY
125 127	GRAVEL	BROWN FLUVIAL DEPOSIT	QUA		BROWN	GRAVEL COURSE
127 139	CLAY,GRAVEL	BROWN TILL	QUA		RED-BRN	CLAY & GRAVEL
139 173	CLAY,GRAVEL	BROWN TILL	QUA		GRAY	CLAY & GRAVEL
173 220	DOLOMITE	PRAIRIE DU CHIEN GROUP	ORD		GRAY	LIMEROCK

223216 27-24- 6BADDAD

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MINNESOTA GEOLOGICAL SURVEY
WATER WELL DATA BASE. 87/08/15.

UNIQUE NO.: 223216
WELL NAME :

COUNTY : HENNEPIN DATE ENTERED:
ADDRESS : 4700 W 78TH ST BLOOMINGTON
QUADRANGLE: BLOOMINGTON 7.5 MINUTE

TOWNSHIP : 27 NORTH UTM-EASTING : 473184
RANGE : 24 WEST UTM-NORTHING: 4967164
SECTION : 6/BADDAD UTM-ZONE : 15
LATITUDE : 44:51:33 N LONGITUDE : 93:20:21 W
LOCATED BY: ADDRESS VERIFICATION

ELEVATION : 822 FT. WATER LEVEL : 20 FT. (EL. 802 FT.)
DEPTH : 75 FT. DATE : 61/04/03
COMPLETED : 61/04/03 AQUIFER(S) : QUAT. BURIED ARTES. AQUIF

WELL USE : DOMESTIC
DRILLER : (AND/OR DATA SOURCE) DEPENDABLE WELL CO
CASING : STEP DOWN
: 002 INCH TO 0072 FEET
SCREEN : DATA UNAVAILABLE
PUMP : DATA UNAVAILABLE

PUMPAGE TEST

DATE: 61/04	TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6
HOURS						
RATE(GPM)	11.5					
DRAWDOWN(FT)	000					

GEOLOGIC LOG

DEPTH INTERVAL (IN FEET)	LITHOLOGY	STRATIGRAPHIC UNIT SYSTEM/GROUP/FORMATION	AGE	HARDNESS	COLOR	DRILLER'S DESCRIPTION
0 45	SILT,PEAT	BROWN QUATERNARY DEPOSIT	QUA		BLACK	PEAT
45 50	CLAY	GRAY TILL	QUA		GRAY	CLAY
50 65	SAND	BROWN FLUVIAL DEPOSIT	QUA		BROWN	SAND
65 75	SAND	FLUVIAL DEPOSIT	QUA			WATER SAND

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WELL LOG 2

223214 27-24- 6CBBBAB

MINNESOTA GEOLOGICAL SURVEY
WATER WELL DATA BASE. 87/08/15.

UNIQUE NO.: 223214
WELL NAME : ROBERT KELLER

COUNTY   : HENNEPIN   DATE ENTERED:
ADDRESS   : 5233 W 82ND ST   BLOOMINGTON
QUADRANGLE: BLOOMINGTON 7.5 MINUTE

TOWNSHIP : 27 NORTH   UTM-EASTING : 472594
RANGE   : 24 WEST   UTM-NORTHING: 4966603
SECTION   :   6/CBBBAB   UTM-ZONE   : 15
LATITUDE : 44:51:15 N   LONGITUDE   : 93:20:48 W
LOCATED BY: ADDRESS VERIFICATION

ELEVATION : 825 FT.   WATER LEVEL : 25 FT. (EL. 800 FT.)
DEPTH   : 158 FT.   DATE   : 65/05/11
COMPLETED : 65/05/11   AQUIFER(S) : ST.PETER

WELL USE : DOMESTIC
DRILLER   : (AND/OR DATA SOURCE) RENNER E. H. WELL
CASING   : STEP DOWN
          : 004 INCH TO 0128 FEET
SCREEN
 MAKE/TYPE: NONE

PUMP
 MAKE/NO. : MYERS   SE 1SA21
 SIZE   : 001.5 HP. -NA- VOLTS   CAPACITY   : -NA- G.P.M.
 TYPE   : SUBMERSIBLE   DROP PIPE   : 00054 FT.

PUMPAGE TEST

DATE: 65/05	TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6
HOURS						
RATE(GPM)	0030					
DRAWDOWN(FT)	000					

GEOLOGIC LOG

DEPTH INTERVAL (IN FEET)	LITHOLOGY	STRATIGRAPHIC UNIT SYSTEM/GROUP/FORMATION	AGE	HARDNESS	COLOR	DRILLER'S DESCRIPTION
0 15	CLAY,SAND	BROWN QUATERNARY DEPOSIT	QUA		BROWN	SANDY CLAY
15 60	CLAY	GRAY TILL	QUA		BLUE	CLAY
60 120	SAND,GRAVEL	BROWN FLUVIAL DEPOSIT	QUA		BROWN	MUDDY SAND & GRAVEL
120 126	SANDSTONE	ST.PETER	ORD	SOFT	WHITE	SAND ROCK
126 158	SANDSTONE	ST.PETER	ORD	HARD	WHITE	SAND ROCK

WELL LOG 3

206183 28-24-31CDAADA

MINNESOTA GEOLOGICAL SURVEY
WATER WELL DATA BASE. 87/08/15.

UNIQUE NO.: 206183
WELL NAME : EDINA NO. 11

COUNTY : HENNEPIN DATE ENTERED:
ADDRESS : 76TH AND KELLOGG EDINA
QUADRANGLE: BLOOMINGTON 7.5 MINUTE

TOWNSHIP : 28 NORTH UTM-EASTING : 473195
RANGE : 24 WEST UTM-NORTHING: 4967810
SECTION : 31/CDAADA UTM-ZONE : 15
LATITUDE : 44:51:54 N LONGITUDE : 93:20:21 W
LOCATED BY:

ELEVATION : 833 FT. WATER LEVEL : UNKNOWN
DEPTH : 403 FT. DATE : / /
COMPLETED : 63/04/16 AQUIFER(S) : JORDAN

WELL USE : PUBLIC SUPPLY,MUNICIPAL
DRILLER : (AND/OR DATA SOURCE) BERGERSON-CASWELL
CASING : STEP DOWN
: 024 INCH TO 0182 FEET
: 016 INCH TO 0321 FEET
SCREEN : DATA UNAVAILABLE
PUMP : DATA UNAVAILABLE

REMARKS : PUMPAGE TEST DATA NOT AVAILABLE
EDINA NO.11 M.G.S. 285

GEOLOGIC LOG

DEPTH INTERVAL (IN FEET)		LITHOLOGY	STRATIGRAPHIC UNIT SYSTEM/GROUP/FORMATION	AGE	HARDNESS	COLOR	DRILLER'S DESCRIPTION
0	36	SAND,GRAVEL	QUATERNARY UNDIFF.	QUA			SAND AND GRAVEL
36	45	CLAY,COBBLE	QUATERNARY UNDIFF.	QUA		BLUE	CLAY AND ROCKS
45	75	CLAY	QUATERNARY UNDIFF.	QUA		BLUE	SANDY CLAY
75	173	CLAY,SAND,COBBLE	QUATERNARY UNDIFF.	QUA		BROWN	CLAY, SAND, GRAVEL & ROCKS
173	179	GRAVEL,COBBLE	QUATERNARY UNDIFF.	QUA			COARSE GRAVEL AND ROCKS DIRTY
179	304	DOLOMITE	PRAIRIE DU CHIEN GROUP	ORD			SHAKOPEE-ONEOTA LIMEROCK
304	327	SANDSTONE	JORDAN	CAM	M. HARD		JORDAN SANDROCK COARSE
327	350	SANDSTONE	JORDAN	CAM	M. HARD		JORDAN SANDROCK
350	362	SANDSTONE	JORDAN	CAM	V. HARD		JORDAN SANDROCK
362	384	SANDSTONE	JORDAN	CAM	M. HARD		JORDAN SANDROCK MED. GRAINED<
384	402	SANDSTONE	JORDAN	CAM	HARD		JORDAN SANDROCK SHALEY<
402	403	SHALE	ST.LAWRENCE	CAM			ST. LAWRENCE SHALE

WELL LOG 4

223215 28-24-31CCDDDD

MINNESOTA GEOLOGICAL SURVEY
WATER WELL DATA BASE. 87/08/15.

UNIQUE NO.: 223215
WELL NAME :

COUNTY : HENNEPIN DATE ENTERED:
ADDRESS : 7711 COMPUTER AVENUE EDINA
QUADRANGLE: BLOOMINGTON 7.5 MINUTE

TOWNSHIP : 28 NORTH UTM-EASTING : 472748
RANGE : 24 WEST UTM-NORTHING: 4967479
SECTION : 31/CCDDDD UTM-ZONE : 15
LATITUDE : 44:51:43 N LONGITUDE : 93:20:41 W
LOCATED BY: ADDRESS VERIFICATION

ELEVATION : 823 FT. WATER LEVEL : 30 FT. (EL. 793 FT.)
DEPTH : 180 FT. DATE : 62/09/27
COMPLETED : 62/09/27 AQUIFER(S) : PRAIRIE DU CHIEN GROUP

WELL USE : DOMESTIC
DRILLER : (AND/OR DATA SOURCE) DEPENDABLE WELL CO.
CASING : STEP DOWN
: 004 INCH TO 0162 FEET
SCREEN : DATA UNAVAILABLE
PUMP
MAKE/NO. : MCDONALD
SIZE : 00001 HP. -NA- VOLTS CAPACITY : -NA- G.P.M.
TYPE : SUBMERSIBLE DROP PIPE : -NA- FT.

PUMPAGE TEST

DATE: 62/09	TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6
HOURS						
RATE(GPM)	0020					
DRAWDOWN(FT)	000					

GEOLOGIC LOG

DEPTH INTERVAL (IN FEET)	LITHOLOGY	STRATIGRAPHIC UNIT SYSTEM/GROUP/FORMATION	AGE	HARDNESS	COLOR	DRILLER'S DESCRIPTION
0 30	SAND	BROWN FLUVIAL DEPOSIT	QUA		BROWN	SAND
30 60	CLAY	GRAY TILL	QUA		GRAY	CLAY
60 160	SAND	BROWN FLUVIAL DEPOSIT	QUA		BROWN	SAND
160 180	DOLOMITE	PRAIRIE DU CHIEN GROUP	ORD		WHITE	ROCK

WELL LOG 5

205220 27-24- 6BCBCBD

MINNESOTA GEOLOGICAL SURVEY
WATER WELL DATA BASE. 87/08/15.

UNIQUE NO.: 205220
WELL NAME : BRIDGEMAN CREAMERIES

COUNTY : HENNEPIN DATE ENTERED:
ADDRESS : HWY. 100 & HWY 494 SE COR. BLOOMINGTON
QUADRANGLE: BLOOMINGTON 7.5 MINUTE

TOWNSHIP : 27 NORTH UTM-EASTING : 472444
RANGE : 24 WEST UTM-NORTHING: 4966930
SECTION : 6/BCBCBD UTM-ZONE : 15
LATITUDE : 44:51:25 N LONGITUDE : 93:20:55 W
LOCATED BY:

ELEVATION : 820 FT. WATER LEVEL : 21 FT. (EL. 799 FT.)
DEPTH : 367 FT. DATE : 64/04/17
COMPLETED : 64/04/16 AQUIFER(S) : JORDAN

WELL USE : INDUSTRY
DRILLER : (AND/OR DATA SOURCE) MC CARTHY WELL CO.
CASING : STEP DOWN
: 012 INCH TO FEET
: 008 INCH TO 0300 FEET
SCREEN : DATA UNAVAILABLE
PUMP
SIZE : -NA- HP. -NA- VOLTS CAPACITY : 00150 G.P.M.

REMARKS : PA 64-820G

PUMPAGE TEST

DATE: 64/04	TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6
HOURS	016					
RATE(GPM)	0160					
DRAWDOWN(FT)	024					

GEOLOGIC LOG

DEPTH INTERVAL (IN FEET)	LITHOLOGY	STRATIGRAPHIC UNIT SYSTEM/GROUP/FORMATION	AGE	HARDNESS	COLOR	DRILLER'S DESCRIPTION
0 150	CLAY,SAND	TILL	QUA			DRIFT
150 285	DOLOMITE	PRAIRIE DU CHIEN GROUP	ORD			LIMEROCK
285 365	SANDSTONE	JORDAN	CAM			SANDROCK
365 367	SHALE	ST.LAWRENCE	CAM			SHALE

WELL LOG 6

205206 27-24- 5CABCBC

MINNESOTA GEOLOGICAL SURVEY
WATER WELL DATA BASE. 87/08/15.

UNIQUE NO.: 205206
WELL NAME :

COUNTY : HENNEPIN DATE ENTERED:
ADDRESS : 8216 ABBOTT BLOOMINGTON
QUADRANGLE: BLOOMINGTON 7.5 MINUTE

TOWNSHIP : 27 NORTH UTM-EASTING : 474443
RANGE : 24 WEST UTM-NORTHING: 4966567
SECTION : 5/CABCBC UTM-ZONE : 15
LATITUDE : 44:51:14 N LONGITUDE : 93:19:24 W
LOCATED BY:

ELEVATION : 865 FT. WATER LEVEL : 57 FT. (EL. 808 FT.)
DEPTH : 157 FT. DATE : 57/11/22
COMPLETED : 57/11/22 AQUIFER(S) : QUAT. WATER TABLE AQUIFER

WELL USE : DOMESTIC
DRILLER : (AND/OR DATA SOURCE) AAMOT WELL CO.
CASING : DATA UNAVAILABLE
SCREEN
MAKE/TYPE: JOHNSON
DIAMETER : 01.25 IN. LENGTH : 00003 FT.
SLOT/GAUZE : 010

PUMP : DATA UNAVAILABLE

REMARKS : PUMPAGE TEST DATA NOT AVAILABLE

GEOLOGIC LOG

DEPTH INTERVAL (IN FEET)	LITHOLOGY	STRATIGRAPHIC UNIT SYSTEM/GROUP/FORMATION	AGE	HARDNESS	COLOR	DRILLER'S DESCRIPTION
0 71	SAND,GRAVEL	FLUVIAL DEPOSIT	QUA			SAND & GRAVEL
71 95	CLAY	TILL	QUA			CLAY
95 100	GRAVEL	FLUVIAL DEPOSIT	QUA			COARSE GRAVEL-WATER BEARING
100 109	GRAVEL	FLUVIAL DEPOSIT	QUA	HARD		PACKED GRAVEL
109 120	CLAY,SAND	GRAY TILL	QUA		GRAY	CLAY SANDY
120 150	CLAY,SAND	GRAY TILL	QUA		GRAY	CLAY SANDY
150 157	SAND	FLUVIAL DEPOSIT	QUA			WATER SAND CLEAN

WELL LOG 7